

Abstract of the Disclosure

This invention relates to novel process of preparing chemically bonded composite hydroxide ceramics by exposing a thermally treated hydroxide 5 ceramic to phosphate reagent and subsequent heat treating the resulting system to initiate a rapid chemical bonding reaction. Such combined hydroxide/chemical bonding process can be used to fabricate ceramics or ceramic coatings for a variety of high and low temperature applications, including corrosion protection, wear resistance, dielectric properties, metal reinforced ceramics, ceramic membranes, 10 non-sticky surfaces, bio-active ceramics, thermal barrier ceramics, non-wetted surfaces, and others.